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ABSTRACT

To determine specific objectives for language arts programs in Alberta schools, a study was conducted in which a comprehensive list of specific objectives was compiled for use in developing tests of reading and writing in grades three, six, nine, and twelve. Measurable objectives were ranked in terms of their importance to the total program, and tests were developed and administered to 5,384 (reading) and 5,377 (writing) students in a random sample of 284 schools. Results indicated that student performance on the reading items was generally satisfactory, particularly phonics in grade three. Students improved or maintained reading skills in the following areas: progressing through suffixes to obtain word meanings in grade six; identifying directly stated details on maps and charts in grade nine; and identifying implied elements of a passage in grades three, six, and nine. Student writing performance was as follows: poor in all four grades in short answer tests, but better in longer assignments; good in limiting content to the topic and writing legibly; and better in using their own langauge in writing than in finding errors in or manipulating a structured assignment. Writing performance was generally satisfactory, although only 74% of grade twelve students wrote at or above functional level. (DF)

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ALBERTA LANGUAGE ARTS

(READING AND WRITING) ACHIEVEMENT STUDY

Executive Summary

A Study Conducted for

The Minister's Advisory Committee on Student Achievement
(MACOSA)

March 1979

by

CANADIAN INSTITUTE FOR RESEARCH

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Funded and Administered by the
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Alberta Education

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Writing (Grades 3, 6, 9 and 12). Student performances were judged by the markers to be weak in all four grades on the short answer section of the writing test, which assessed abilities in capitalization, spelling, punctuation and sentence structure. Performances were stronger on the longer writing assignment, which asked students to write a story in grade 3, a story or description in grade 6, and an exposition in grade 9, and an argument in grade 12. All students achieved high scores on the writing assignment for limiting content to the topic and writing legibly. Alberta students appeared to be more successful at using their own language in writing than at finding errors in or manipulating a structured assignment. The performance on the "Writing assignment" part of the test was generally satisfactory but there was some concern about the fact that only 74 percent of grade 12 students performed at the functional level or better. (Students whose writing was rated as "functional" were able to communicate at a basic level but needed instruction in some aspects of writing skills.)

ABSTRACT

At the time this study was being conducted, the Alberta Education curriculum guides for language arts stated the program objectives in rather general terms. The researcher, therefore, began by compiling a comprehensive list of specific objectives suitable for use in developing tests of reading and writing at the grades 3, 6, 9, and 12 levels. The steering committee for the study, with the assistance of the Curriculum Branch of Alberta Education and its language arts coordinating committee, then ranked the measurable objectives in terms of their importance to the total program. When the committees had established priorities, the researcher had available a selected list of objectives for which appropriate test items could be developed.

The researcher used standard piloting and field testing procedures to investigate administrative and scoring techniques and to determine the need for revisions. The manual scoring technique required for the writing tests presented a special challenge. To ensure fair and objective marks, two specially trained markers scored each composition using two different marking scales. In the event of a major discrepancy between the two marks, a third marker scored the composition. The researcher considers both the reading and writing tests to be superior to those available commercially, because of the greater face-validity for the Alberta curriculum and because of the unique marking techniques which were employed.

The reading and writing tests were administered to each of grades 3, 6, 9 and 12 in a random sample of 284 schools on May 17, 1978.

Reading (Grades 3, 6, 9 and 12). Student performance on the reading items were judged by the markers to be generally satisfactory at all four grade levels tested, and the performance in phonics at the grade 3 level was particularly satisfactory. Alberta students appeared to be improving, or at least maintaining, their reading skills as they progressed through the suffixes to obtain word meanings in grade 6; in identifying directly stated details on maps and charts in grade 9; and in identifying implied elements of a passage in each of grades 3, 6 and 9.

PREFACE

The Minister's Advisory Committee on Student Achievement (MACOSA) was established by ministerial order in October 1976 in response to growing concerns expressed by the public at large, government, labor, business, students and educators regarding the quality and standards of basic education in Alberta.

MACOSA commissioned a number of studies, primarily to provide basic information for a summary of current levels of achievement in Alberta and to provide baseline data for future assessment. These studies fell into three categories: (1) preliminary studies, (2) achievement studies, and (3) other studies.

The purpose of this study, entitled the Alberta Language Arts (Reading and Writing) Achievement Study, was to provide information about current levels of student achievement in reading and writing in Alberta schools and to provide a data base for future assessments.

This report, which represents the findings and conclusions of the researchers, was presented to MACOSA as information.

MEMBERS OF THE MACOSA STEERING COMMITTEE

J. Wood (Chairman)	Coordinator, Test Development, Student Evaluation and Data Processing Services Branch, Alberta Education
C. Braun	Professor, Faculty of Education University of Calgary
I. Hargreaves	Supervisor, Language Arts, Edmonton Public Schools
J. Rennie	Language Arts Consultant, Alberta Education
H. G. Shark (Ex officio)	Associate Director (Research), Planning and Research Branch, Alberta Education
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Consultant and Recorder: H. C. Rhodes	Consultant, Planning and Research Branch, Alberta Education

Acknowledgements

The staff of the Canadian Institute for Research acknowledges the contributions of the members of the Study Steering Committee. Particular appreciation is expressed to the Committee Chairman, Mr. J. Wood, for the time and energy he devoted to the study.

Special thanks is also given to the following persons and groups of persons:

- the principals and teachers in the province of Alberta who were involved in the pilot testing or the final testing
- the team of markers who assisted in marking the writing tests
- consultants, A. Mitchell and E. E. Plattor, who assisted in the test development
- the team of research assistants who aided in the pilot testing, training of markers, and marking: J. Hall, M. Hill, D. Sandercock, V. Smith, and B. Spear
- K. Hanson who typed the preliminary draft of this report as well as the final report

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PART I
EXECUTIVE SUMMARY

I. INTRODUCTION

I.1.1 Background

The Minister's Advisory Committee on Student Achievement (MACOSA) was established by Ministerial Order in Alberta in October 1976. MACOSA was established in response to growing concerns on the part of the public, the Government, labor, business, students, and professional educators regarding education. Interest groups have been concerned that the standards for student achievement may have declined in recent years, and that these standards may be inadequate for current and future needs of students and various educational and employment sectors. Interest groups have also been concerned that the standards are not clearly demonstrable given the varieties of student programs, marking procedures and criteria, and that the means of reporting student achievement may be inadequate for purposes such as certification of broad and specific learnings in various curricular areas, career counselling, and selection procedures used by post-secondary institutions and employers.

MACOSA commissioned several studies to facilitate the development of a summary of current levels of student progress in Alberta and to provide baseline data for future assessments. More

specifically, on August 18, 1977, Alberta Education contracted the Canadian Institute for Research (CIR) to assess two selected areas of communication/language arts: reading and writing.

CIR worked under the supervision of a MACOSA-appointed Steering Committee to gather available data needed to assess the current levels of reading and writing in grades 3, 6, 9 and 12 in Alberta, to interpret the data in terms of student achievement, and to compile the information together with recommendations into a report submitted to Alberta Education on September 30, 1978.

I.1.2. Purposes

Three major purposes served as guidelines for the general features of the study's design.

- To collect and report information on the current levels of student achievement of selected objectives in reading and writing in grades 3, 6, 9 and 12 in Alberta schools.
- To produce useful and timely summaries of the current status of student achievement so that MACOSA has a basis for submitting reports and recommendations to the Alberta Minister of Education.
- To construct a data base of student achievement information which can be used as baseline information for future assessments.

I.1.3 Limitations of the Assessment

The subjects involved in this study were limited to 10 percent of the students at each of grades 3, 6, 9 and 12 in the province of Alberta. Therefore, the sample used in this study is representative of the total student population within the limitations imposed upon it by the sampling procedures.

The items on the instruments used in this study were developed to assess the reading and writing achievement levels of students. The content of the items assessed the reading and writing skills as defined by the objectives which were selected by the Steering Committee after consultation with the Curriculum Branch and consultants in the language arts. Although every attempt was made to sample the language arts programs as defined by selected reading and writing objectives, the results of this study are limited by the restricted time period designated for testing and the number and content of the items which may or may not have sufficiently sampled all of the selected objectives.

2. DESIGN OF THE STUDY

I.2.1 Introduction

The design for the study was initially outlined in a study proposal. It was later reviewed and finalized as to details at several meetings between CIR personnel and the Steering Committee. It should be noted that the design model which was used has produced results that describe only the *current* status of student

achievement in the province. The results do not show causal relationships.

I.2.2 Sampling Plan

The Sampling Plan was obtained from the Student Evaluation and Data Processing Branch of Alberta Education and reviewed by CIR personnel and the Steering Committee. Sampled schools were initially contacted by Alberta Education and were contacted at a later date by CIR. For grades 3 and 6 two stratifying variables were used to categorize the schools: 1977-78 enrollment in the target grades and type of school system.

For grades 9 and 12 the decision was made to stratify using enrollment only. Schools randomly selected for each enrollment category were then randomly assigned to various studies, this study included.

The finalized sample for the Language Arts study was comprised of the following: 102 schools at the grade 3 level, 101 schools at the grade 6 level, 56 schools at the grade 9 level, and 25 schools at the grade 12 level.

The 1977-78 enrollment lists of the schools in the province were used to determine the total number of students to be tested. Based on these enrollment lists, tests were sent to the schools. Half of the tests were reading tests and half were writing tests. The total usable returns from the schools were as follows: 1,408 in grade 3 reading, 1,385 in grade 3 writing; 1,597 in grade 6

reading, 1,598 in grade 6 writing; 1,464 in grade 9 reading, 1,495 in grade 9 writing; 915 in grade 12 reading and 899 in grade 12 writing.

I.2.3 Student Outcomes/Objectives

For purposes of the study it was necessary to obtain a list of measurable objectives in reading and writing at grades 3, 6, 9 and 12 respectively. From those lists of objectives available from Alberta Education by September 30, 1977, it was determined that additional work would have to be done in order to produce lists of measurable objectives. It was agreed at a Steering Committee Meeting that CIR personnel and consultants would produce comprehensive lists of student outcomes/objectives by reviewing current curriculum guides, skill lists, and authorized textbooks. These lists of outcomes/objectives were produced and were ranked by the Steering Committee as to the desirability and feasibility of their assessment. The provincial Language Arts Coordinating Committee also ranked these objectives using the same criteria. Opportunity was given for the inclusion of additional objectives.

Based on the results of this ranking, finalized lists of selected objectives in reading and writing were used as a basis for producing and selecting assessment items and exercises for the testing. The comprehensive lists of student outcomes/objectives have been included as an appendix to Part II of this report.

I.2.4 Instrument Development

A preliminary step in the development of the objective-based instruments was to review existing reading and writing tests and to consider the possibility of adapting them for use in this study. It was concluded that none of the available tests, in their entirety, assessed the selected reading and writing objectives. Therefore, the strategy used to produce the instruments was to adapt items where available and to develop new items where necessary. All items were then reviewed by consultants and the Steering Committee, and revisions made as indicated.

For each pilot reading test a total of four multiple-choice items were prepared for each objective. The proofreading section of each pilot writing test included four items for each objective. Each writing test also included a writing production task (extended discourse). Administrators' Manuals were developed for use with each of the instruments.

The pilot testing was conducted to investigate the administration procedures and the items of the proposed tests. The pilot testing involved a total of 809 students in grades 3, 6, 9 and 12 in a total of 32 classrooms in 16 urban and rural schools in Calgary and area which had not been selected for inclusion in the MACOSA studies. Arrangements for testing were made with each district superintendent and school principal. A pilot test team administered the tests to the students. All reading test answers were recorded by the students on computer answer sheets which were later

machine-scored by Alberta Education. All writing test answers were recorded by the students in the test booklets. These booklets were later hand-scored by a team of markers who recorded the results on computer sheets. No difficulty in using the testing format was experienced by either the students or the testing team. Comments from students and teachers concerning the tests were also collected by the pilot testing team. An item analysis was computed for the reading tests and an error count was computed for the writing test. Letters of appreciation were sent by CIR to all schools who participated in the pilot testing.

The Steering Committee and CIR staff made revisions to the pilot test instruments and Administrators' Manuals using the results of the item analysis, the error count, observations made by the pilot testing team, comments from students and teachers, and observations made by the markers. Camera-ready copies of the finalized instruments were produced and printed.

I.2.5 Data Collection

A letter dated February 8, 1978, was sent by the Associate Deputy Minister of Education to the school superintendents in Alberta. The request was made for the superintendents to ask for the cooperation of the sampled schools which were to be included in the testing program. Individual school principals were later contacted by CIR and given more specific details concerning the testing program.

Approximately two weeks before the testing date of May 17, 1978, tests, computer answer sheets and Administrators' Manuals were distributed to the 284 schools. Distribution was made by using the bus lines, couriers, and special delivery mail. Sufficient tests were sent to ensure that half the students at the specified grade level in each school would write the reading test and half the students would write the writing test. Selection of students for writing each test was to be done on a random basis. Instructions were given that all answer sheets and test booklets, used and unused, were to be returned to the Canadian Institute for Research. Returned materials were collated at CIR.

I.2.6 Scoring

All reading test answer sheets were computer scored by Alberta Education. The scoring procedures employed in the marking of the writing tests had previously been developed and used to mark the pilot writing tests. Minor revisions were made to the scoring keys before the final tests were marked. A team of 20 markers was trained to mark the final tests. The proofreading section, which included capitalization, punctuation, spelling, and sentence writing, was marked by one marker using a Proofreading Marking Scale for each grade. The punctuation and capitalization were scored as correct or incorrect; the spelling was scored for identification of error as well as correct spelling of identified error; and the sentence writing was scored on scales which identified types

of errors in sentence writing and variety in sentence writing.

Modified holistic scoring of all writing products was done by two markers on a scale of five. In the event of a discrepancy which was greater than one, a third marker scored the product. It was determined during the pilot testing that reader-agreement for this marking was very high as only three tests out of a total of 379 had to have a third marker.

Scoring of the writing product was also done using a Descriptive Marking Scale for each grade. These scales were based on the objectives as selected for each grade level.

I.2.7 Data Analysis Plan

Basic distributional statistics were computed by Alberta Education using the reading and writing test data. Summaries of grade level data for reading and writing were produced as follows: number of students attempting each item, percentages of students correctly answering each item, and percentages of items achieved as keyed to objectives.

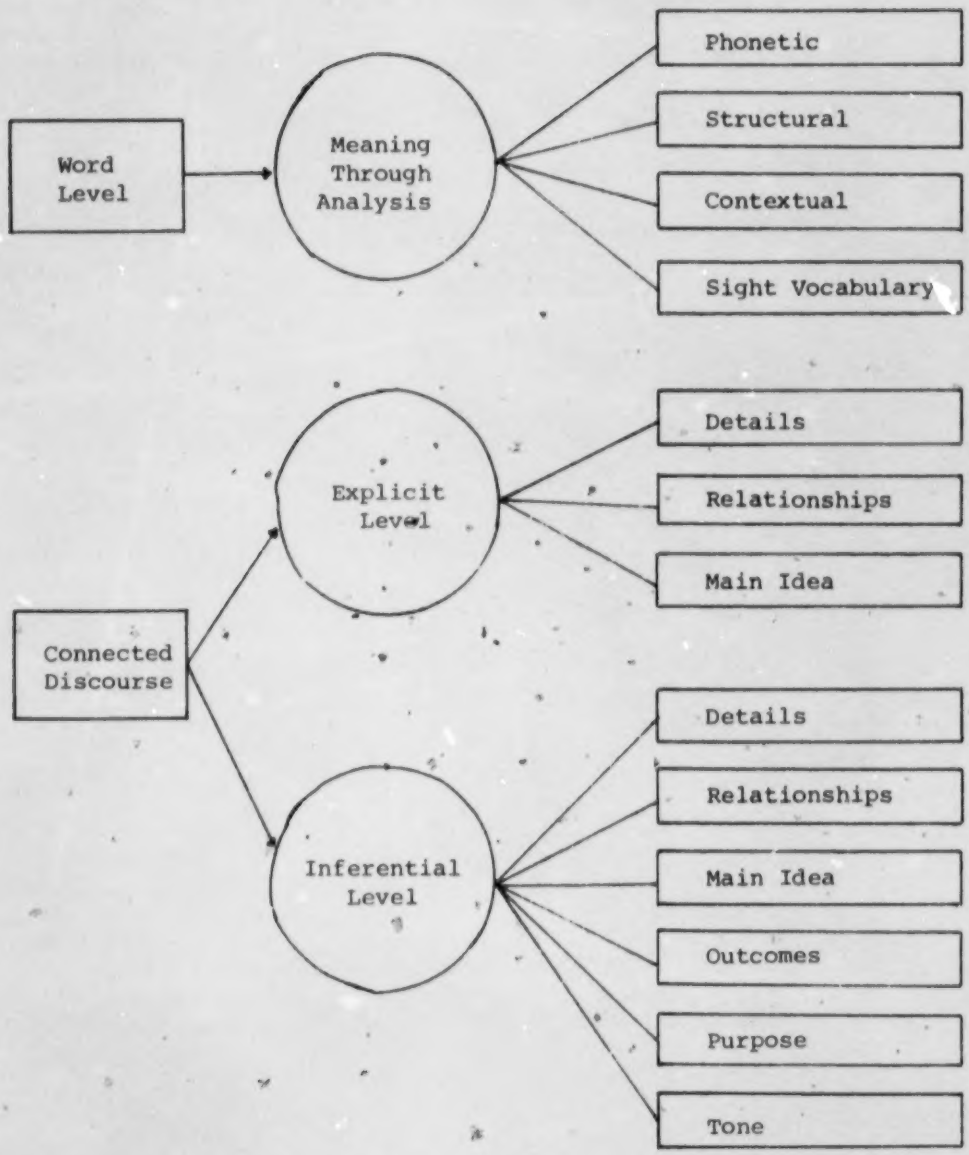
3. SUMMARY OF READING RESULTS

I.3.1. Introduction

The following chart indicates the organization of the reading objective clusters as assessed in the study. The majority of the clusters were composed of more than one objective.

Chart I-1

ORGANIZATION OF READING OBJECTIVES*



*For complete lists of objectives, see Appendix to Part II of the Report.

I.3.2 Reading in Grades 3, 6, 9 and 12

Table I-1 presents a summary of reading across the grades. The figures indicate the average percent correct for the items used to test each cluster of objectives. Not all clusters of objectives were assessed at each grade level, therefore some columns in the table are incomplete.

Table I-1

Reading - Grades 3, 6, 9 and 12
Male and Female

	Grade 3	Grade 6	Grade 9	Grade 12
Word Level: Meaning Through Analysis				
I.A.1 Phonetic	80.8	--	--	--
I.A.2 Structural	78.4	47.3	67.0	62.3
I.A.3 Contextual	76.6	76.1	74.5	70.2
I.A.4 Sight Vocabulary	67.6	68.3	--	--
Connected Discourse: Explicit Level				
II.A.1 Details	63.1	72.0	56.1	--
II.A.2 Relationships	65.5	60.6	62.7	70.0
II.A.3 Main Idea	67.9	71.9	67.5	76.3
Connected Discourse: Inferential Level				
II.B.1 Details	67.5	57.3	--	73.3
II.B.2 Relationships	77.9	66.5	65.8	57.4
II.B.3 Main Idea	66.7	57.2	59.5	74.8
II.B.4 Outcomes	--	59.4	68.1	72.5
II.B.5 Purpose	--	--	61.8	71.0
II.B.6 Tone	--	--	62.9	63.2

In the Word Level category, grade 3 students achieved an average percent correct of 80.8 when using phonetic analysis. This percentage represents the highest achievement score in the reading assessment. Structural analysis involved decoding unfamiliar words through the use of structural elements. Grade 6 students achieved an average of only 47.3 percent of the items. The achievement levels in Contextual analysis were similar at all grade levels. Sight Vocabulary recognition at grades 3 and 6 was 67.6 percent and 68.3 percent respectively even though the vocabulary tested was appropriate to the grade level.

The Connected Discourse items were based on reading passages. The Explicit Level involved the more factual levels of the passage. The Inferential Level required a higher level of thinking as the student had to make inferences and judgments.

Several of the averages in the Connected Discourse categories were low. It appears however that there is an improvement through grades 6 to 12 in Outcomes which involved making judgments, predictions, and conclusions.

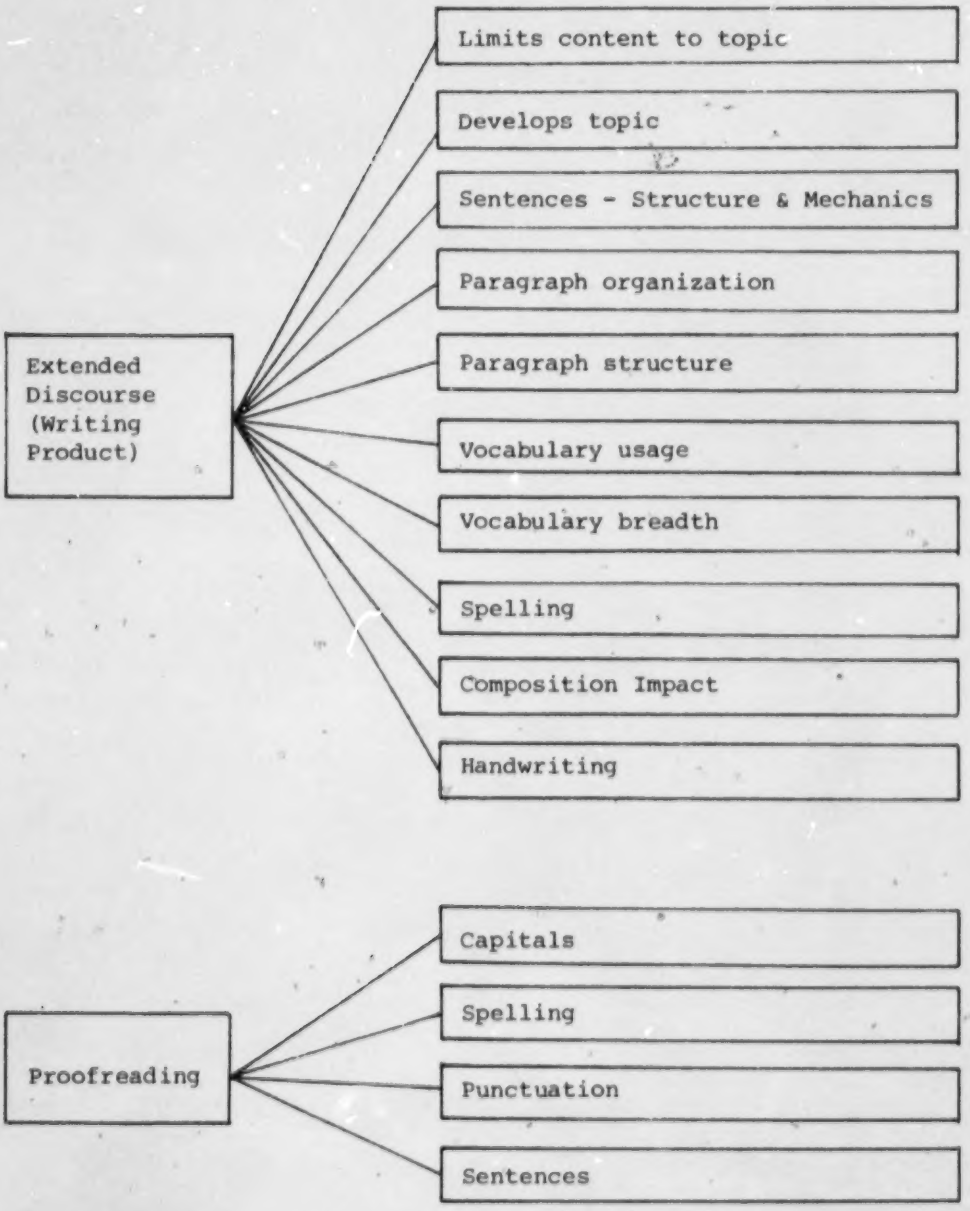
4. SUMMARY OF WRITING RESULTS

I.4.1 Introduction

Chart I-2 indicates the organization of the writing objective clusters as assessed in the study. The majority of the clusters were composed of more than one objective.

Chart I-2

ORGANIZATION OF WRITING OBJECTIVES*



*For complete lists of objectives see Appendix to Part II of the Report.

I.4.2 Writing in Grades 3, 6, 9 and 12

A summary of the results of the writing assessment is presented in Table I-2. The three marking scales used to assess the writing tests are presented in detail in Part II of the main report. The Descriptive scoring data as presented in Table I-2 indicates the percentage of writing products which were assessed as a three or a four. These scores denoted positive aspects of writing as keyed to each of the objectives. The Holistic scoring data as presented in the following table indicates those writing products which were scored as being acceptable. The Proofreading data indicates average percentages correct (no errors) for items used to assess capitalization, spelling, punctuation, and sentence writing.

Because all objectives or clusters of objectives were not tested at each grade level, several of the columns in Table I-2 are incomplete.

Table I-2 suggests that students in each of the grade levels do not experience difficulty in limiting content to the topic when producing a writing product. Grade 12, however, had difficulty in developing a topic.

All percentages were low for Sentences which assessed the ability to write sentences in terms of structure and mechanics. Percentages for paragraph organization and structure were also low for those grades assessed.

Except for Grade 12, percentages for vocabulary usage and

Table I-2

Writing - Grades 3, 6, 9 and 12
Male and Female

	Grade 3	Grade 6	Grade 9	Grade 12
Descriptive Scoring				
I.1 Limits content to topic	94.3	93.2	95.0	89.8
I.2 Develops topic	79.5	84.5	71.8	47.4
I.3 Sentences (structure & mechanics)	51.0	39.7	61.0	49.8
I.4 Paragraph organization	--	57.7	55.7	55.2
I.5 Paragraph structure	--	30.1	48.8	66.1
I.6 Vocabulary usage	84.6	88.4	71.1	61.1
I.7 Vocabulary breadth	84.2	84.4	86.0	58.9
I.8 Spelling	68.4	69.8	83.6	73.9
I.9 Composition impact	73.0	63.2	68.8	73.2
I.10 Handwriting	87.9	74.1	88.7	77.5
Holistic Scoring	24.7	27.1	51.9	24.3
Proofreading Scoring				
II.1 Capitals	70.4	--	--	--
II.2 Spelling	46.5	43.5	55.1	47.8
II.3 Punctuation	39.9	50.0	35.9	58.0
II.4 Sentence Writing	65.8	27.7	24.2	18.0

breadth were consistently higher than several of the other objectives assessed. Spelling as assessed in the writing products was lower in grades 3 and 6 than in grades 9 and 12.

The percentages for Composition Impact varied somewhat from grade to grade. Handwriting does not appear to be a serious problem in the students' writing.

In the Holistic scoring, which identified those writing products assessed as acceptable in terms of the writing scale, grade 9 performance was approximately twice that of the other grades.

In the Proofreading section which assessed the mechanics used in writing, all scores were low. The Sentence Writing evaluated variety in sentence writing as well as sentence structure. The scores in this category correspond to the scores in the Descriptive scoring category where sentence writing in the writing product was evaluated for structure and mechanics.

In summary, it appears that the majority of students are in need of additional instruction in those skills which are necessary for the production of an acceptable writing product. Difficulty in the mechanics of writing and sentence writing was indicated in the Proofreading section of the assessment. These findings correspond to findings in the Descriptive and Holistic scoring which indicated difficulty in mechanics and sentence writing as well as difficulty in other skills such as paragraph organization. Vocabulary usage and breadth did not appear to be a problem except at the grade 12 level. Students were also able to limit content

to topic and to develop a topic except at the grade 12 level.

It appears, in general, that many students have the necessary ideas and vocabulary which are used in the production of a writing product, but lack the necessary organizational and mechanical skills used in writing.

5. VARIABLE OF SEX

I.5.1 Introduction

Significant differences were computed for the male and female performance in the reading and writing clusters.

I.5.2 Reading Results

Few significant differences appear to exist between the reading performance of males and females. At the grade 3 level the results suggest that female performance is higher in structural analysis and inferring the main idea, and that male performance is higher in sight vocabulary.

At the grade 6 level females excelled in inferring relationships and males excelled in structural analysis.

The performance for three clusters of objectives was significantly different in favor of the females at the grade 9 level: identifying main idea, and inferring outcomes and tone.

At the grade 12 level females performed higher than males in structural analysis and identifying relationships.

There does not appear to be any consistent significant

differences on reading performance between the grade levels.

I.5.3 Writing Results

Considerable significant differences in writing performance existed in favor of the females at each of the grade levels assessed. Except for limiting content to the topic at the grades 3 and 6 levels, and sentence structure and mechanics at the grade 12 level, it appears that in the Descriptive scoring (See Table I-2) the females performed higher than the males on the writing product. The results of the Holistic scoring of the writing product supported the findings in the Descriptive scoring as the females consistently performed better than males.

Several significant differences which exist in the Proof-reading results are also in favor of the females: at the grades 3 and 6 levels significant differences existed in spelling, punctuation, and sentence writing; at the grade 9 level significant differences were evident in spelling and sentence writing; and at the grade 12 level significant differences existed in spelling and punctuation.

6. RECOMMENDATIONS

The Contractor recommends that:

6.1 Assessment of the language arts in the Province of Alberta should be an on-going process using the present data as baseline data for comparisons in future assessments. Future assessments would include the study of such problems as reliability of the

reliability of the tests over time (test-retest studies), relationship between reading and writing and other studies relating teacher activities to pupil growth. There appears to be no reason why all pupils in all schools should be tested each time. A stratified random sample of students would make an appropriate selection for on-going tests.

6.2 A needs assessment study should be conducted in the Province of Alberta to determine terms of reference for language arts programs. Such a needs assessment program would provide information about what is currently in place in language arts programs as well as indicating gaps in such programs. Tests could then be matched to both existing program components and to those which need to be put in place. This would address firmly the question of the validity of the testing program.

6.3 Indicators should be established for all the goals of the provincial language arts programs so that each facet of language growth can be monitored (i.e., cognitive and affective goals). This recommendation recognizes that many of the established goals of the language arts programs cannot be readily monitored. The establishing of indicators for these goals could lead to the establishing of monitoring procedures for the indicators. This would also have the added advantage of monitoring growth over time.

6.4 Existing data should be scrutinized to determine whether it is feasible to conduct additional research activities using

present data. This recommendation suggests that considerable data has already been gathered in reading and writing and that additional research activities should be designed to capitalize on this data.

6.5 An item bank should be established for use in ongoing evaluation of the language arts. Such an item bank would make it possible for individual school systems to assess specific areas of competence which might be idiosyncratic to their own programs. This system is especially useful if flexibility in instructional programs is to be maintained.

6.6 Training sessions should be held for teachers who plan to administer and score the tests, because the grading, particularly of written materials, is important for the validity of comparisons that may be made. This procedure is especially important if the tests are to be used for comparisons across schools or over time.

6.7 Data from test administration should be accumulated from year to year. Correlational analyses, relating the results of reading and writing to other competency areas, should be conducted and presented in the form of expectancy tables. In this way the institution will have both criterion and prediction data.

6.8 While the tests were designed for grades 3, 6, 9 and 12, it would be appropriate to try them at surrounding grade levels. Since items and goals differ within the present tests, this procedure would allow for the analysis of developmental trends.

6.9 Additional demographic data should be included in future assessments. This recommendation refers to the fact that little demographic data was collected in the present study. Additional variables such as geographic location, attitudes, value of language arts, etc. could be useful in future assessments.

6.10 The test administration procedures with minor revisions, should be repeated in the next assessment. This recommendation arises from the observations made by the Contractor in regard to test administration procedures.